LISTING OF THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in this application. Added text is indicated by underlining, and deleted text is indicated by ~~strikethrough~~. Changes are identified by a vertical bar in the margin.

1. (Currently amended) A cluster resonator, comprising:

a first conducting plane;

a second substantially parallel conducting plane;

a cluster of vias of essentially uniform length oriented substantially normal to the conducting planes, each via in the cluster comprising a first end and a second end ~~and interposed therebetween~~;

a first conducting pad disposed in a third plane substantially parallel and ~~proximate the first conducting plane,~~ capacitively coupled to the first conducting plane and physically coupled with the vias of the cluster of vias proximate their first ends; and

a second conducting pad disposed in a fourth plane substantially parallel and ~~proximate the second conducting plane,~~ capacitively coupled to the second conducting plane and physically coupled with the vias of the cluster of vias proximate their second ends, wherein the vias are physically connected to only the first and second conducting pads..

2. (Currently amended) The cluster resonator of claim 1, wherein ~~the~~ a combined inductance and capacitance of the ~~resonator elements~~cluster

of vias form an electromagnetically resonant shunt circuit between the first and second conducting planes.

3. (Original) The cluster resonator of claim 2, wherein the vias of the cluster of vias are disposed along a perimeter that defines an interior region.

4. (Original) The cluster resonator of claim 3, wherein one or more interior vias are routed within the interior region of the cluster of vias.

5. (Original) The cluster resonator of claim 4, wherein the interior vias comprise portions of transmission lines passing electrical signals vertically through the cluster resonator.

6. (Original) The cluster resonator of claim 1, wherein the first conducting pad is external relative to the first and second conducting planes.

7. (Original) The cluster resonator of claim 1, wherein the first conducting pad is internal relative to the first and second conducting planes.

8. (Original) The cluster resonator of claim 1, wherein the second conducting pad is external relative to the first and second conducting planes.

9. (Original) The cluster resonator of claim 1, wherein the second conducting pad is internal relative to the first and second conducting planes.

10. (Original) The cluster resonator of claim 1, wherein the first and second conducting pads are internal relative to the first and second conducting planes.

11. (Original) The cluster resonator of claim 1, wherein the first and second conducting pads are external relative to the first and second conducting planes.

12. (Currently amended) The cluster resonator of claim 1, wherein ~~the~~ its topology comprises a mechanically balanced structure.

13. (Currently amended) The cluster resonator of claim ~~2~~1, wherein the first and second conducting planes are metallic layers incorporated with a multi-layered panel circuit.

14. (Original) The cluster resonator of claim 13, wherein the first and second conducting planes are metallic layers incorporated within a multi-layered printed circuit board and the cluster resonator comprises an array of plated through holes.

15. (Original) The cluster resonator of claim 13, wherein the first and second conducting planes are metallic layers incorporated within a multi-chip module.

16. (Original) The cluster resonator of claim 13, wherein the first and second conducting planes are metallic layers incorporated within a semiconductor chip.

17. (Original) The cluster resonator of claim 3, wherein the cluster of vias is disposed along a circular path.

18. (Original) The cluster resonator of claim 3, wherein the cluster of vias is disposed along an elliptical path.

19 (Original) The cluster resonator of claim 3, wherein the cluster of vias is disposed along a polygonal path.

20. (Currently amended) The cluster resonator of claim ~~5~~4, wherein ~~the number and~~ spacing of ~~the~~ vias within ~~of~~ the cluster of vias ~~effect~~ effects a Faraday cage that substantially shields the interior region from RF fields propagating within the first and second conducting planes.

21. (Currently amended) The cluster resonator of claim 20, wherein ~~the number and~~ spacing of the vias ~~of~~ within the cluster of vias in relation to the interior vias ~~effect~~ effects a predetermined line impedance in the interior vias.

22. (Currently amended) A cluster resonator, comprising:

a first conducting plane;

a second substantially parallel conducting plane;

a cluster of vias of essentially uniform length oriented substantially normal to the conducting planes, each via in the cluster comprising a first end and a second end ~~and interposed there between~~;

first ends of each via in the cluster of vias coupled with the first conducting plane; and

a first conducting pad disposed in a third plane parallel ~~to~~ and external to the second conducting plane and capacitely coupled thereto and physically coupled to each via in the cluster of vias proximate their second ends, wherein the vias in the cluster of vias are physically connected to only the first conducting plane and the first conducting pad.

23. (Currently amended) The cluster resonator of claim 22, wherein ~~the~~ a combined inductance and capacitance of the ~~resonator elements~~cluster of vias form an electromagnetically resonant shunt circuit between the first and second conducting planes.

24. (Currently amended) The cluster resonator of claim ~~23~~22, wherein the vias of the cluster of vias are disposed along a perimeter that defines an interior region.

25. (Original) The cluster resonator of claim 24, wherein one or more interior vias are routed within the internal region of the cluster of vias.

26. (Currently amended) The cluster resonator of claim ~~25~~24, wherein the interior vias comprise portions of transmission lines passing electrical signals vertically through the resonant element.

27. (Cancelled) The cluster resonator of claim 22, wherein the conducting pad is internal relative to the first and second conducting planes.

28. (Cancelled) The cluster resonator of claim 22, wherein the conducting pad is external relative to the first and second conducting planes.

29. (Currently amended) The cluster resonator of claim 22 comprising a second cluster of vias, each via in the second cluster of vias comprising a first end and a second end, wherein the vias in the second cluster of vias are coupled proximate their first ends to the second conducting plane and proximate their second ends to a second conducting pad disposed in a fourth plane parallel ~~to~~ and ~~proximate~~ external to the first conducting plane and capacitely coupled to the first conducting plane, wherein the vias in the cluster of vias are physically connected to only the second conducting plane and the second conducting pad.

30. (Currently amended) The ~~second~~ cluster resonator of claim 29, wherein the first and second conducting pads are internal relative to the first and second conducting planes and the second conducting pad is ~~disposed in a fourth plane parallel to and~~ proximate the first conducting pad.

31 (Currently amended) The cluster resonator of claim 22, wherein ~~the~~ its topology comprises a mechanically balanced structure.

32. (Currently amended) The cluster resonator of claim ~~23~~22, wherein the first and second conducting planes are metallic layers incorporated with a multi-layered panel circuit.

33. (Original) The cluster resonator of claim 32, wherein the first and second conducting planes are metallic layers incorporated within a multi-layered printed circuit board and the cluster resonator comprises an array of plated through holes.

34. (Currently amended) The cluster resonator of claim ~~32~~22, wherein the first and second conducting planes are metallic layers incorporated within a multi-chip module.

35. (Currently amended) The cluster resonator of claim ~~32~~22, wherein the first and second conducting planes are metallic layers incorporated within a semiconductor chip.

36. (Original) The cluster resonator of claim 24, wherein the cluster of vias is disposed along a circular path.

37. (Original) The cluster resonator of claim 24, wherein the cluster of vias is disposed along an elliptical path.

38. (Original) The cluster resonator of claim 24 wherein the cluster of vias is disposed along a polygonal path.

39. (Currently amended) The cluster resonator of claim ~~26~~24, wherein ~~the number and~~ spacing of the vias of the cluster of vias effect a Faraday cage that substantially shields the interior region from RF fields propagating within the first and second conducting planes.

40. (Currently amended) The cluster resonator of claim 39, wherein ~~the number and~~ spacing of the vias of the cluster of vias in relation to the interior vias effect a predetermined line impedance in the interior vias.

41. (New) The cluster resonator of claim 1, wherein the first conducting pad is proximate the second conducting pad.